

Mumbai University

Syllabus + Books

B.Sc.IT: SEMESTER – V

(SYLLABUS)

[2018 – 2019]

PAPER - II

INTERNET OF

THINGS

— : SYLLABUS : —

UNIT I

THE INTERNET OF THINGS | DESIGN PRINCIPLES FOR CONNECTED DEVICES | INTERNET PRINCIPLES |
HTTPS

- ⇒ The Internet of Things:
 - An Overview
 - The Flavour Of The Internet of Things
 - The "Internet" Of "Things"
 - The Technology Of The Internet Of Things
 - Enchanted Objects
 - Who Is Making The Internet Of Things?
- ⇒ Design Principles For Connected Devices:
 - Calm And Ambient Technology
 - Magic As Metaphor
 - Privacy
 - Keeping Secrets
 - Whose Data Is It Anyway?
 - Web Thinking For Connected Devices
 - Small Pieces
 - Loosely Joined
 - First-Class Citizens On The Internet
 - Graceful Degradation
 - Affordances
- ⇒ Internet Principles:
 - Internet Communications:
 - An Overview
 - IP
 - TCP
 - The IP Protocol Suite (TCP/IP)
 - UDP
 - IP Addresses
 - DNS
 - Static IP Address Assignment
 - Dynamic IP Address Assignment
 - IPv6
 - MAC Addresses
 - TCP and UDP Ports
- ⇒ An Example:
 - HTTP Ports
 - Other Common Ports
 - Application Layer Protocols
 - HTTP
- ⇒ HTTPS:
 - Encrypted HTTP
 - Other Application Layer Protocols

UNIT II

THINKING ABOUT PROTOTYPING | PROTOTYPING EMBEDDED DEVICES

- ⇒ Thinking About Prototyping:
 - Sketching
 - Familiarity
 - Costs Versus Ease Of Prototyping
 - Prototypes And Production

Turn Over ↗

- *Changing Embedded Platform*
- *Physical Prototypes And Mass Personalisation*
- *Climbing Into The Cloud*
- *Open Source Versus Closed Source*
- *Why Closed?*
- *Why Open?*
- *Mixing Open And Closed Source*
- *Closed Source For Mass Market Projects*
- *Tapping Into The Community*

⇒ **Prototyping Embedded Devices:**

- *Electronics*
- *Sensors*
- *Actuators*
- *Scaling Up The Electronics*
- *Embedded Computing Basics*
- *Microcontrollers*
- *System-On-Chips*
- *Choosing Your Platform*
- *Arduino*
- *Developing On The Arduino*
- *Some Notes On The Hardware*
- *Openness*
- *Raspberry Pi*
- *Cases And Extension Boards*
- *Developing On The Raspberry Pi*
- *Some Notes On The Hardware*

UNIT



PROTOTYPING THE PHYSICAL DESIGN | PROTOTYPING ONLINE COMPONENTS

⇒ **Prototyping the Physical Design:**

- *Preparation*
- *Sketch*
- *Iterate And Explore*
- *Nondigital Methods*
- *Laser Cutting*
- *Choosing A Laser Cutter*
- *Software*
- *Hinges And Joints*
- *3D Printing*
- *Types Of 3D Printing*
- *Software*
- *CNC Milling*
- *Repurposing/Recycling*

⇒ **Prototyping Online Components:**

- *Getting Started With An API*
- *Mashing Up APIs*
- *Scraping*
- *Legalities*
- *Writing A New API*
- *Clockodillo*
- *Security*
- *Implementing The API*
- *Using Curl To Test*
- *Going Further*

Turn Over ↗

- Real-Time Reactions
- Polling
- Comet
- Other Protocols
- MQ Telemetry Transport
- Extensible Messaging and Presence Protocol
- Constrained Application Protocol

UNIT IV

TECHNIQUES FOR WRITING EMBEDDED CODE | BUSINESS MODELS | PROVIDE INFRASTRUCTURE

- ⇒ **Techniques For Writing Embedded Code:**
 - Memory Management
 - Types Of Memory
 - Making The Most Of Your RAM
 - Performance And Battery Life
 - Libraries
 - Debugging
- ⇒ **Business Models:**
 - A Short History Of Business Models
 - Space And Time
 - From Craft To Mass Production
 - The Long Tail Of The Internet
 - Learning From History
 - The Business Model Canvas
 - Who Is The Business Model For?
 - Models
 - Make Thing
 - Sell Thing
 - Subscriptions
 - Customisation
 - Be a Key Resource
- ⇒ **Provide Infrastructure:**
 - Sensor Networks
 - Take A Percentage
 - Funding An Internet Of Things Startup
 - Hobby Projects And Open Source
 - Venture Capital
 - Government Funding
 - Crowdfunding
 - Lean Startups

UNIT V

MOVING TO MANUFACTURE | ETHICS

- ⇒ **Moving To Manufacture:**
 - What Are You Producing?
 - Designing Kits
 - Designing Printed circuit boards
 - Software Choices
 - The Design Process
 - Manufacturing Printed Circuit Boards
 - Etching Boards
 - Milling Boards
 - Assembly
 - Testing

Turn Over ►

- *Mass-Producing The Case And Other Fixtures*
- *Certification*
- *Costs*
- *Scaling Up Software*
- *Deployment*
- *Correctness And Maintainability*
- *Security*
- *Performance*
- *User Community*

⇒ **Ethics:**

- *Characterizing The Internet Of Things*
- *Privacy*
- *Control*
- *Disrupting Control*
- *Crowdsourcing*
- *Environment*
- *Physical Thing*
- *Electronics*
- *Internet Service*
- *Solutions*
- *The Internet Of Things As Part Of The Solution*

Turn Over ↗

– : BOOKS : –

1. BOOK TITLE: ARTIFICIAL INTELLIGENCE & SOFT COMPUTING FOR BEGINNERS

AUTHOR'S: ANANDITA DAS BHATTACHARJEE

PUBLISHER: SHROFF

EDITION: 1ST

YEAR: 2014

PAPERBACK: 720 PAGES

DOWNLOAD/BUY: @[BLOGGER](#) | @[AMAZON](#) | @[FLIPKART](#)

2. BOOK TITLE: ARTIFICIAL INTELLIGENCE

AUTHOR'S: ELAINE RICH | KEVIN KNIGHT | SHIVASHANKAR NAIR

PUBLISHER: McGRAW-HILL

EDITION: 3RD

YEAR: 01/JULY/2017

PAPERBACK: 588 PAGES

DOWNLOAD/BUY: @[BLOGGER](#) | @[PDF](#) | @[TORRENT](#)

3. BOOK TITLE: ARTIFICIAL INTELLIGENCE: A RATIONAL APPROACH

AUTHOR'S: RAHUL DEVA

PUBLISHER: SHROFF

EDITION: 1ST

YEAR: 2018

DOWNLOAD/BUY: @[BLOGGER](#) | @[AMAZON](#) | @[FLIPKART](#)

4. BOOK TITLE: A FIRST COURSE IN ARTIFICIAL INTELLIGENCE

AUTHOR'S: DEEPAK KHEMANI

PUBLISHER: McGRAW-HILL

EDITION: 1ST

YEAR: 01/JULY/2017

PAPERBACK: 944 PAGES

DOWNLOAD/BUY: @[BLOGGER](#) | @[AMAZON](#) | @[PINTEREST](#)

5. BOOK TITLE: ARTIFICIAL INTELLIGENCE: A MODERN APPROACH

AUTHOR'S: STUART RUSSEL | PETER NORVIG

PUBLISHER: PEARSON

EDITION: 3RD

YEAR: 2015

PAPERBACK: 1164 PAGES

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